Space Weather Forecast

Issued on Tuesday, 21 June 2022 at 01:02 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Daily chance of an isolated moderate-class X-ray flare.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low, with occasional common class X-ray flares, the largest of which came from a region that is moderately large and active, near the central meridian in the north. Some flares also originated from another moderately large and complex sunspot region in the northwest quadrant. However this region has changed little over the past 24 hours and is now approaching the western limb, soon expected to rotate away. All other regions are small or relatively simple and stable.

A Coronal Mass Ejection (CME) was observed leaving the sun around 20/1745 UTC. The results of its analysis are not yet fully known but it's unlikely to be Earth-directed. No other CMEs were observed on available imagery. A large filament can also be seen hanging off the northwestern quadrant. It is currently stable but has showed signs of movement in recent days.

Solar Wind / Geomagnetic Activity: The solar wind speed was around 550 km/s and slowly declining initially when, around 20/1300 UTC, it suddenly rose to 600-620 km/s before coming back to 520-530 km/s after 20/1810 UTC. The number of particles the solar wind is made of followed a similar pattern. The total magnetic field strength was generally weak, with small deviations in its important north-south component, but stayed largely negative between 20/1300-1700 UTC. These solar wind parameters seem to indicate a brief encounter with the fast speed stream originating from a negative coronal hole, resulting in a geomagnetic activity becoming temporarily Unsettled (Kp 1-3).

Energetic Particles / Solar Radiation: The high energy proton flux remained at background, with no solar radiation storms observed in the period.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is likely to be Low, with a daily chance of an isolated moderate-class flare and a slight chance of a strong flare.

Solar Wind / Geomagnetic Activity: No CMEs feature in the forecast. Solar winds should continue their initial decline and return to slow-ambient levels by Day 2. They are expected to become slightly elevated at the end of Day 4, under the influence of a coronal hole HSS (CH93/-). Geomagnetic activity should be mostly Quiet with perhaps the odd Unsettled interval through much of the period, but become Unsettled to Active with a slight chance of a G1/Minor storm at the end of Day 4 (24th).

Energetic Particles / Solar Radiation: Solar radiation storms are not likely in the period and proton flux should remain at background levels. However, there is a daily slight chance of an S1 or greater event occurring, due to the presence of a relatively large and complex sunspot region

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transiting over the western disc.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	1	1	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	30	30	30	30
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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